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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,924	04/15/2004	Chris Grainger	17281-002001	9037
20985	7590	10/04/2005	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			KIM, TAE JUN	
		ART UNIT		PAPER NUMBER
		3746		
DATE MAILED: 10/04/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/825,924	GRAINGER ET AL.
	<b>Examiner</b> Ted Kim	<b>Art Unit</b> 3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 425, 530 (in Fig. 5, “536” appears it should be –530--). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- “the fuel tanks” lacks proper antecedent basis and is also not supported by the specification. This should be replaced by –the oxidizer tanks--.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 6, 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (4,802,333). Smith teaches an attitude control system for a spacecraft, comprising: a supply of oxidizer 204 with at least one tank; at least one nozzle 214; a conduit 202 fluidly coupling the supply of oxidizer and the nozzle, wherein the conduit provides a pathway for oxidizer to flow in a downstream direction from the supply of oxidizer toward and into the nozzle; a pressure regulator 217 coupled to the conduit and interposed between the supply of oxidizer and the nozzle, wherein the pressure regulator regulates the pressure of oxidizer at a location downstream of the pressure regulator and upstream of the nozzle to a set point pressure at or below a first pressure (col. 3, lines 20), wherein the first pressure comprises the pressure required to maintain the oxidizer in a gas state to ensure that the any oxidizer flowing through the conduit is in a gas state prior to entering the nozzle.

***Claim Rejections - 35 USC § 103***

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-7, 11, 12, 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzman (4,424,679) in view of Hamke et al (6,393,830) and optionally Jacobson et al (6,250,072). Holzman teaches a supply of oxidizer with at least one tank 24; at least one nozzle 16; a conduit 22 fluidly coupling the supply of oxidizer/nitrous oxide and the nozzle, wherein the conduit provides a pathway for oxidizer to flow in a downstream direction from the supply of oxidizer toward and into the nozzle; a pressure regulator 22 coupled to the conduit and interposed between the supply of oxidizer and the nozzle, wherein the pressure regulator regulates the pressure of oxidizer at a location downstream of the pressure regulator and upstream of the nozzle to a set point pressure at or below a first pressure, wherein the first pressure comprises the pressure required to maintain the oxidizer in a gas state to ensure that the any oxidizer flowing through the conduit is in a gas state prior to entering the nozzle. Holzman does not teach his hybrid rocket motor is part of an attitude control system for spacecraft. Hamke et al teach it is old and well known in the art to employ a plurality of hybrid rockets for the attitude control of spacecraft (col. 5, lines 50+) wherein the conduit supplies oxidizer to the hybrid rocket motor and nozzle. It would have been obvious to

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one of ordinary skill in the art to employ the pressure regulated hybrid rocket of Holzman with a attitude control system for spacecraft, as a well known application for such rockets. As for the oxidizer, Holzman does not teach nitrous oxide, however, Jacobsen et al teach nitrous oxide is a well known oxidizer for hybrid rockets and it would have been obvious to one of ordinary skill in the art to employ such as a well known oxidizer.

Jacobsen further teach either gas or liquid nitrous oxide can be drawn from the tank 2 (col. 3, lines 7+) and it would have been obvious to one of ordinary skill in the art to draw off either from the tank to deliver the oxidizer to the pressure regulator. As for the oxidizer in conduit upstream of the pressure regulator being in both a liquid state and a gas state, note that any oxidizer in 220 in liquid form will inherently contain at least some gas/vapor, due to the vapor pressure of the liquid. As for the amount of thrust being less than 0.5 lbf, this is a well known range for thrusters and would have been obvious to employ as an obvious matter of finding the workable ranges in the art.

8. Claims 1-7, 11, 12, 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (4,802,333) in view of Hamke et al (6,393,830) and optionally Jacobson et al (6,250,072).. Smith teaches various aspects of the claimed invention but do not teach any of the thrusters are hybrid rockets. Hamke et al teach it is old and well known in the art to employ a plurality of hybrid rockets for the attitude control of spacecraft (col. 5, lines 50+) wherein the conduit supplies oxidizer to the hybrid rocket motor and nozzle. It would have been obvious to one of ordinary skill in the art to employ the pressure regulated hybrid rocket of Smith with a attitude control system for

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spacecraft, as a well known application for such rockets. As for the oxidizer, Smith does not teach nitrous oxide, however, Jacobsen et al teach nitrous oxide is a well known oxidizer for hybrid rockets and it would have been obvious to one of ordinary skill in the art to employ such as a well known oxidizer. Jacobsen further teach either gas or liquid nitrous oxide can be drawn from the tank 2 (col. 3, lines 7+) and it would have been obvious to one of ordinary skill in the art to draw off either from the tank to deliver the oxidizer to the pressure regulator. As for the oxidizer in the conduit upstream of the pressure regulator being in both a liquid state and a gas state, note that any oxidizer in 220 in liquid form will inherently contain at least some gas/vapor, due to the vapor pressure of the liquid. As for the amount of thrust being less than 0.5 lbf, this is a well known range for thrusters and would have been obvious to employ as an obvious matter of finding the workable ranges in the art.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied art applied to claim 12 in view of Fix et al (3,507,296) and optionally Whitehead et al (5,026,259). The above prior art do not teach an accumulator downstream of the pressure regulator. Fix et al teach a tank 11 with pressure regulator 14 followed by an accumulator 12 which dampens the pressure fluctuations. Whitehead et al teach it is old and well known in the art to employ an accumulator 9 prior to entering the thrusters 12. It would have been obvious to one of ordinary skill in the art to employ an accumulator downstream of the pressure regulator in order to reduce pressure fluctuations from the pressure regulator.

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10. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied art, and further in view of Apfel (4,880,185). The prior art teach using a plurality of thrusters and an oxidizer tank connected to a manifold but do not teach using a plurality of oxidizer tanks connected to the manifold. Apfel teach it is old and well known in the spacecraft attitude control system art to employ a plurality of tanks 16 for the oxidizer to feed a manifold and the thrusters. It would have been obvious of ordinary skill in the art to employ a plurality of tanks to allow for redundancy and/or as a safety measure, e.g. in case one of the tanks develops a leak, the other tanks would not be emptied.

***Double Patenting***

11. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

12. Claims 19-21 are objected to under 37 CFR 1.75 as being substantial duplicates of claims 2-4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is

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proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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